H21/CRT electronic : Plans

CRT meeting - 09 April 2009

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21cm BAO team

- DFS (ADC) board noise performance
- Future test plans (Pittsbutgh, …)
- Long term development issues

ADC board noise spectrum , 2Chx32768Samples

Channel 1 Spectrum
Input: 50,13MHz, <1 ADUpp

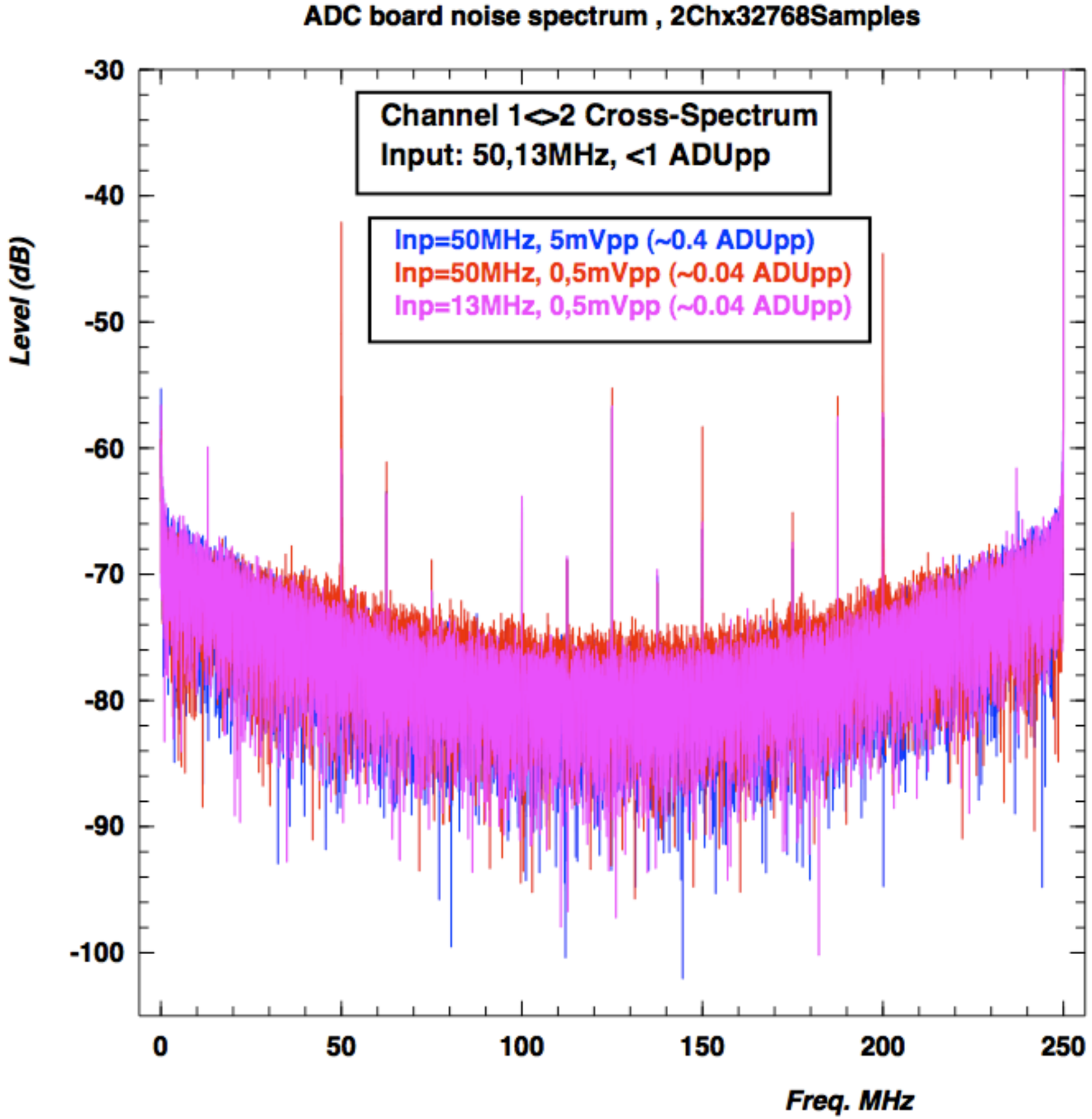
Inp=50MHz, 5mVpp (~0.4 ADUpp)
Inp=50MHz, 0,5mVpp (~0.04 ADUpp)
Inp=13MHz, 0,5mVpp (~0.04 ADUpp)

Level (dB)

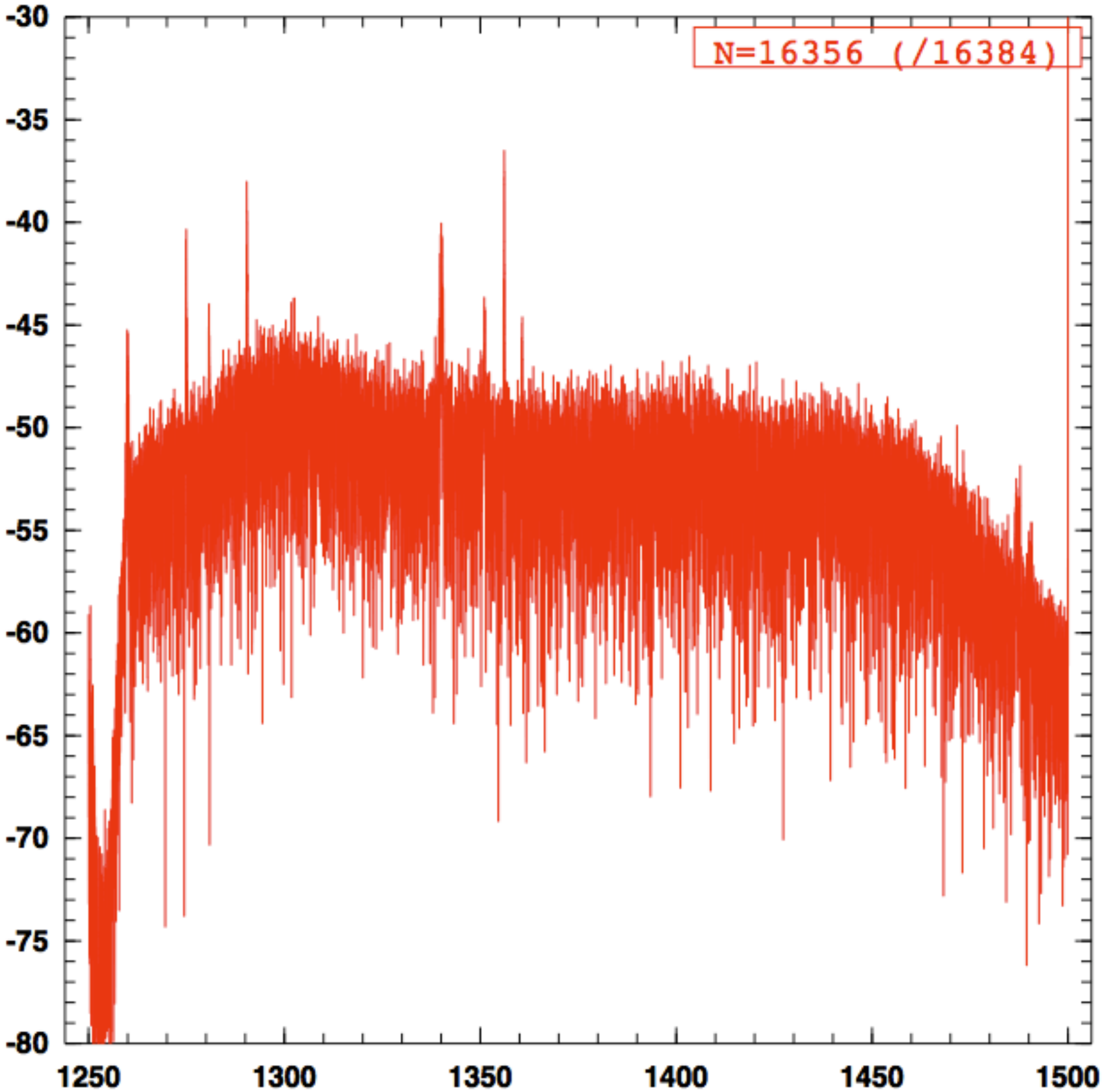
-20
-25
-30
-35
-40
-45
-50
-55
-60
-65

0
50
100
150
200
250

Freq. MHz


ADC board noise spectrum , 2Chx32768Samples
Channel 1<>2 Cross-Spectrum
Input: 50,13MHz, <1 ADUpp
Inp=50MHz, 5mVpp (~0.4 ADUpp)
Inp=50MHz, 0,5mVpp (~0.04 ADUpp)
Inp=13MHz, 0,5mVpp (~0.04 ADUpp)
Level (dB)
-30
-40
-50
-60
-70
-80
-90
-100
0
50
100
150
200
250
Freq. MHz

2Chx32768 CrossSpectrum At Nancay



Firmwares

- DFS/ADC board firmware : RawData, FFT8K+8K
  - Some improvements needed for increasing reliability
- Current version (v=49.4) : 64 kB maximum packet size, SGDMA with ~ 500 MB/s DMA transfer rate to memory , ~ 200 MB/s maximum sustained acquisition rate on - Handles the byte-swap
- Dual fibre read-out firmware under development

Tests at Pittsburgh (1)

- Aim : Multi-channel acquisition + beam reconstruction
- We need to define a detailed test program :
  - Number of channels , 1 or two cylinders
  - Some calibration procedure
  - The acquisition configuration (hardware/software)
- The processing software should be prepared according to the defined program

Tests at Pittsburgh (2)

- Logistic issues : define possible dates
- A number of simple questions has to be answered :
  - cable types and length
  - Length of optical fibres (we need to order them)
  - The operation can be made simpler if we can avoid to transport the computers (PC's with PCI-Express 4X + (RAID) disks)
  - If yes, we will have to ship one PCI-Express card to be tested on the computer

Electronic card manufacturing schedule (1)

- DFS/ADC board 4 channel/board - We are currently using the two initial prototype boards (v=1). (2)
- A third board based on the existing first PCB version is being manufactured (+1 End of April/May)
- Two new version of the PCB (V1.2) is being manufactured
- The two new boards should be at LAL in June (+2 June / before summer)
- If OK, 5-6 additional boards will be fabricated (+6)
- We should have a total of 10 boards (40 channels) in summer or september 2009